ENTOMOLOGY.—*The genus* Ollarianus (*Homoptera: Cicadellidae*) *in North America, including Mexico.*[1]

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(Communicated by C. F. W. MUESEBECK.)

The leafhopper genus *Ollarianus* was erected by Ball in 1936[2] to include several similar species from the Southwestern United States and *Eutettix balli* Van Duzee, a Jamaican species, which was designated as the genotype. The species of the genus are similar in color and general appearance. The vertex is short, broad, almost parallel-margined, and rounded to the front. Most species have four black spots in a row between the anterior margins of the eyes. The outer and inner pairs may differ in size in different species or be entirely wanting as in *strictus*. There may be a pair of round black spots on the outer portion of the pronotum and in some species a pair on the scutellum.

In order to identify the Mexican species, which resemble those from the southwestern United States in form and coloration, it was necessary to study the characters of the male genitalia. This study has revealed the fact that although the aedeagi may differ in form among the species of the genus, all have either one or two pairs of pygofer spines, the number, position, and type being definite for any species. Certain species exhibit decided affinities on the basis of genital structures. For instance, *strictus* and *bullatus* can be separated only by the longer ventral spines in the latter species, while *tripartitus* has an aedeagus quite similar to those of *strictus* and *bullatus*. The aedeagi of *ollus* and *vestigii* are almost exactly alike, but the apical spines are entirely different. The aedeagi of *lobatus, insignis, bidentatus,* and *armus* are similar in type, and each of these species has one pair of ventral pygofer spines. The aedeagus of *rudiculus,* as well as that of *muesebecki,* is unique in type as compared to all the other species.

It is unfortunate that *E. balli* was made the genotype as that species was described from a single specimen from Jamaica that had lost the abdomen. The genital characters for neither sex are therefore known. In spite of this fact, it has seemed advisable to determine and illustrate the specific characters of the other known species and to describe those that have distinct genital characters but that have not been previously treated.

According to present records only one species, *strictus,* is common to both the United States and Mexico. *O. rubianus* Ball is a member of the genus *Eutettix,* while *Exitianus armus* Ball is a member of *Ollarianus.* After studying all the species which have been placed in or assigned to the genus, and examining the genitalia, it seems advisable to include in the genus the described species *balli, bullatus, strictus, rudiculus, ollus,* and *armus* and to describe at this time six Mexican species, *muesebecki, tripartitus, insignis, bidentatus, lobatus,* and *vestigii,* which are new.

SEPARATION OF SPECIES ON THE BASIS OF GENITAL STRUCTURES

1. Pygofer with one pair of spines 2
   Pygofer with two pairs of spines 3
2. Spines basodorsal, especially long . . . *bidentatus*
   Spines more ventral, much shorter . . . . . *armus, insignis, lobatus*
3. Ventral pair of spines especially short, inconspicuous . . . . . *strictus*
   Ventral spines longer, conspicuous 4
4. Aedeagus erect, short, broadened toward apex, and appearing to have three apical processes . . . . . *bullatus, tripartitus*
   Aedeagus longer, not broadened apically but usually with a pair of apical processes 5
5. Aedeagus with a dorsally curved, hooked process at apex of elongate, slender ventral portion 6
   Aedeagus not elongate and slender and without dorsally curved hooked apices 7
6. Apical pygofer spines short, enlarged at apex, and set with pointed teeth . . . . . *ollus*
   Apical pygofer spines long, slender, with a foot-shaped enlargement at apex . . . . *vestigii*
7. Pygofer spines flat, broad at base, bladelike, aedeagus with a median dorsal projection . . . . . *muesebecki*
   Pygofer spines not bladelike, broadened near apex to be spearlike, aedeagus elongate, broadened at middle, and constricted just before blunt apex . . . . . *rudiculus*

Ollarianus balli (Van Duzee)

Eutettix balli Van Duzee, Bull. Buffalo Soc. Nat. Hist. **8**: 68. 1907.

[1] Received September 29, 1944.
[2] Bull. Brooklyn Ent. Soc. **31**: 59. 1936.

A small pale species with a transverse row of four black spots on anterior portion of vertex. Length 4 mm.

Vertex broadly rounded scarcely longer at middle than next the eyes.

Color pale testaceous-yellow, vertex with a transverse row of four black spots between the anterior margins of the eyes. The outer pair is on the ocelli, the median pair minute, the four are about equidistant in spacing. Pronotum with a round black spot behind each eye and a transverse spot on the disk. Scutellum with a pair of median brown spots. Face pale with a pair of minute spots on base. Elytra subhyaline marked with fuscous spots on clavus, disk, and apical areoles smoky.

Genitalia: Nothing is known of either male or female structures.

This species was described from a single specimen from Montego Bay, Jamaica, in 1907, the abdomen of which was missing. In order to determine the identity of this species, which has been made the genotype, it will be necessary to obtain a male from the same locality and determine the male structures by dissection. There is no question about its generic relationship to the other species included in the following pages.

Ollarianus armus (Ball), n. comb.

Exitianus armus Ball, Bull. Brooklyn Ent. Soc. **28**: 227. 1933.

Vertex broadly rounded, about one-third wider between eyes at base than length at middle. Length 3.7–4.5 mm.

Color pale yellowish, a large round black spot next each eye just above margin, a pair of proximal small transverse spots on middle between the larger spots. Pronotum with a large round black spot next each lateral margin behind eye, some smaller markings on disk. Scutellum pale with a black line along each side of apex. Elytra subhyaline, veins dark brown. Face pale with two minute spots on middle of face below margin.

Genitalia: Female last ventral segment slightly excavated each side of a broad median slightly produced lobe, which is embrowned on margin. Male plates triangular, narrowing to slender apices. Styles broad at base rapidly tapered to a pointed, outwardly curved apex. Aedeagus rather short and thick with a pair of rather long pointed apical processes which are directed ventrally. A dorsally produced portion arises at base. There is one pair of spines on pygofer and these arise ventrally at about the middle.

This species has been recorded for southern Arizona only, where it was taken from desert hackberry at Tucson and Superior by Dr. Ball.

Ollarianus strictus (Ball), n. comb.

Eutettix strictus Ball, Can. Ent. **32**: 204. 1900.
Chlorotettix minor DeLong, Ohio State Univ. Bull. **23**: 6. 1919. New synonym.

A yellowish species usually without definite markings. Length 3.5–4 mm.

Vertex broadly roundedly produced, almost twice as wide between eyes at base as median length.

Color yellowish, often washed with gray and usually unmarked. Face pale yellow. Sometimes the vertex has the four characteristic small spots of other species of the genus in a transverse row before the eyes and a pair of small round spots on disc of scutellum.

Genitalia: Female last ventral segment with posterior margin truncate, slightly produced at middle. Male plates broad at base, long, triangular with the acute apices produced and bright orange in color. The styles are rather broad to near apex where they are excavated on the outer margin to form rather pointed apices which are curved outwardly. Aedeagus short, broadened from base to form what appears to be in lateral view three distinct apical portions. In ventral view these appear as lateral protrusions. There are two pairs of spines on the pygofer, a long pair that arises from the dorsal median portion and extends ventrally and caudally. A smaller pair is short and arises on the ventral basal portion of the pygofer.

This species was described from specimens taken in Arizona and it has since been collected in Texas. Mexican specimens have been collected at Hermosillo, Sonora, November 29, 1927 (M. F. 1220); Cajeme, Mexico, November 19, 1935 (M. B. 384); Yaqui Valley, Sonora; Montemorelos, Nuevo León, June 3, 1930 (M. F. 2023); Los Mochis, Sinaloa, May 17, 1930 (M. B. 301); and Eloxochitlan, Oaxaca, June 27, 1932 (M. F. 2638), collected by Dr. Dampf. Specimens were also collected at Tehuantepec, Oaxaca, October 13, 1941, by Caldwell, Good, Plummer, and DeLong.

Ollarianus rudiculus Ball

Ollarianus rudiculus Ball, Journ. Washington Acad. Sci. **26**: 434. 1936.

A pale species with four round black dots in a row across anterior portion of vertex and a pair on scutellum. Length 5 mm.

Vertex broad, rounded, more than twice as wide between eyes at base as median length.

Color pale yellow, a row of four round black spots about equidistant from one another across vertex between anterior margins of eyes. The middle pair is a little posterior to the outer pair. Pronotum with a round black spot on anterior margin, either side just posterior to middle of eye. Scutellum, with a pair of small round proximal spots on disk. Face pale with portions of brownish arcs.

Genitalia: Female last ventral segment truncate, the median third roundedly produced. Male plates broad at base, narrowed, then produced into rather broad apices which are divergent, sloping to outer margin at apex. Styles long and slender, broadened at base but rapidly narrowed and produced to slender produced portions which are sharply pointed at apex. The aedeagus is broadened at middle then constricted before an apical headlike tip. On the dorsoanterior margin a slight enlarged process is formed just beyond the enlarged portion. Two pairs of spines occur on the pygofer. A long pair arises on the dorsal apical portion and extends ventrally. In caudal view they are broad, bladelike and are pointed at apex. A second pair arises ventrally at about the middle of the pygofer and extends inwardly and dorsally.

The specimens from which this species was described were all taken in southern Arizona. It has been collected in Texas by Prof. J. N. and Mrs. Dorothy Knull.

Ollarianus bullatus Ball

Ollarianus bullatus Ball, Journ. Washington Acad. Sci. **26**: 433. 1936.

A black-faced species with four spots across anterior portion of vertex or without vertex markings. Length 4 mm.

Vertex broad, blunt, scarcely twice as broad between eyes at base as median length.

Color, face black, appearing as a black, marginal line from above. The vertex may not bear color markings. In well-marked specimens with a row of four black spots across anterior portion of vertex between anterior margins of eyes. The central pair is larger so that in poorly marked specimens the central pair may persist when the outer pair is not visible. Elytra pale, veins inconspicuous.

Genitalia: Female last ventral segment with posterior margin truncate, with a broad, roundedly triangular median projection. Male plates broad at base, roundedly narrowed to long acute tips. Style rather broad, excavated on outer margin just before outwardly bent and pointed apices. Aedeagus very similar to *strictus* with a broadened apex which appears divided into three apical portions. Pygofer with two pairs of long spines. One pair arises dorsally and basally, and the other arises on the ventral median portion.

This species can be separated from *strictus* by the black face and the long ventral pygofer spines.

All specimens in the type series were from southern Arizona. The collections made by Professor and Mrs. Knull have shown that it occurs in Wickenburg, Patagonia, and the Santa Rita Mountains in Arizona, and in the Davis Mountains and Val Verde County in Texas.

Ollarianus ollus Ball

Ollarianus ollus Ball, Journ. Washington Acad. Sci. **26**: 433. 1936.

Resembling *rudiculus* in form and general appearance but with distinct male genitalia. Length 4–4.6 mm.

Vertex broad, rounded, almost parallel-margined.

Color pale yellow, with four faint black spots in a transverse row between the anterior margins of the eyes. These are sometimes wanting. Elytra slightly smoky in the males with the cross nervures emphasized.

Genitalia: Female last ventral segment with posterior margin nearly truncate, the median third roundedly produced. Male plates narrowed to elongate pointed apices. The concave portion of margins before the tips are heavily margined with black. Style rather broad to near apex where the outer margin is rather deeply excavated forming a narrow fingerlike apex, which is curved outwardly. Aedeagus composed of a ventral straight portion, which has a dorsally curved pointed hook at apex. At the base a dorsal portion is directed dorsally

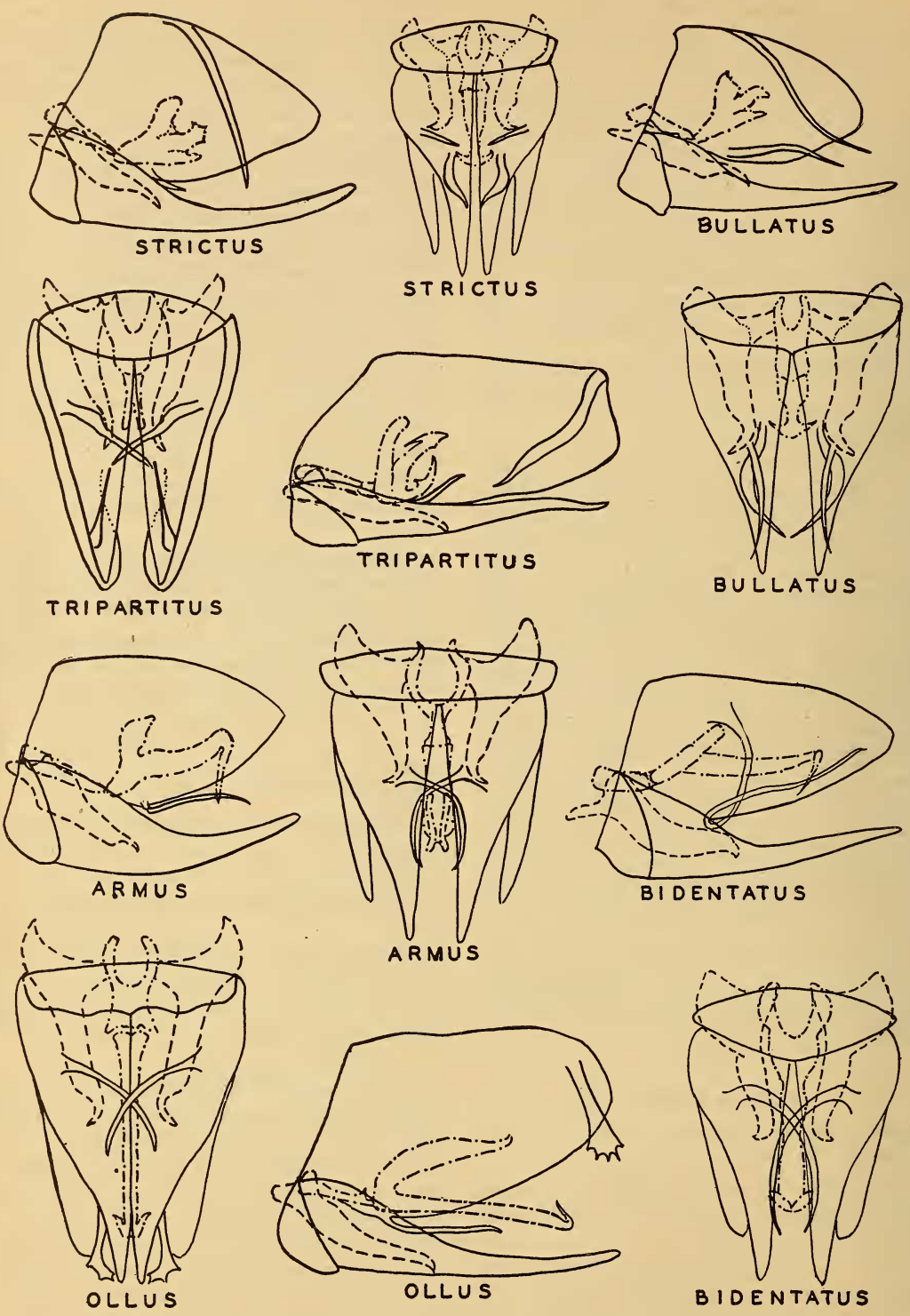

FIG. 1.—Leafhoppers of genus *Ollarianus* Ball: Ventral and lateral views of male genital structures of species as labeled.

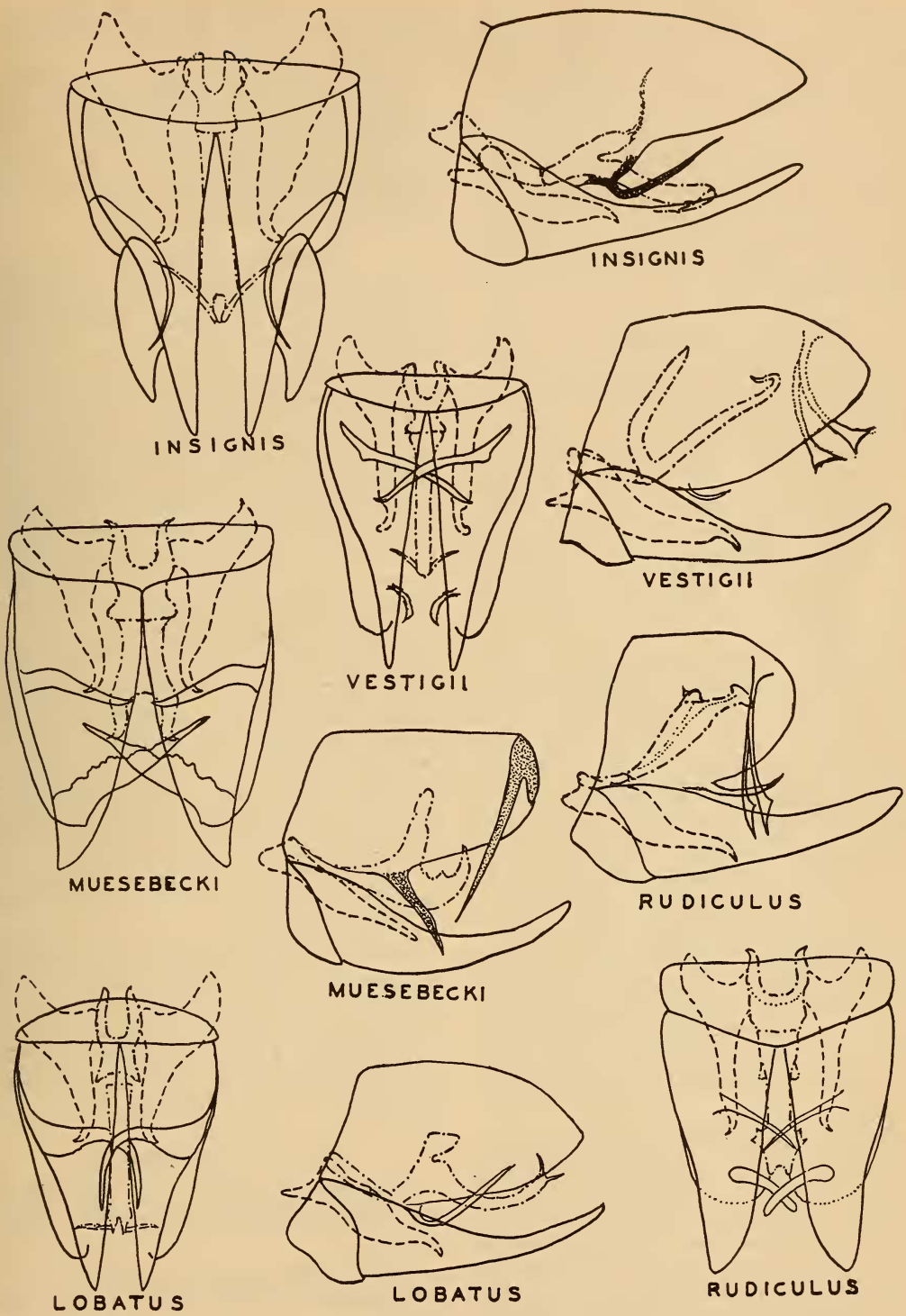

FIG. 2.—Leafhoppers of genus *Ollarianus* Ball: Ventral and lateral views of male genital structures of species as labeled.

and apically. It is shorter and a little broader than the ventral portion and is narrowed at the apex. There are two pairs of pygofer spines. The apical pair arises on the apical dorsal portion of the pygofer. These are rather short, enlarged at apex and bear several radially arranged apical pointed teeth. The ventral pair is long and slender, arises near the base of the pygofer, and extends inwardly and apically.

The specimens from which this species was described were taken in the Santa Rita Mountains of Arizona.

Ollarianus muesebecki, n. sp.

In general form, appearance, and coloration resembling *rudiculus* but with distinct male genitalia. Length 4.5 mm.

Vertex broadly rounded, more than twice as wide between eyes at base as median length.

Color yellowish, vertex with four round black spots about equidistant from each other in a row across vertex between anterior margins of eyes. Pronotum with a round black spot on anterior margin behind each eye. Pronotum appearing darker.

Genitalia: Female last ventral segment roundedly produced with a rounded notch or excavation each side of median third, giving the posterior margin a trilobate appearance. Male plates narrowed to bluntly pointed, outwardly curved apices. Style broad at base rather gradually but strongly tapered to acutely pointed outwardly curved apex. Aedeagus rather short and erect, the apex divided into two converging processes which are upturned. At about its middle a process extends dorsally which is rather long, thick, and blunt at apex. The apical spines arise on the dorsoapical portion of the pygofer and extend ventrally. These are flattened like broad blades in caudal view. The ventral spines arise at about the middle on the ventral side and extend inwardly.

Holotype male collected at Iguala, Guerrero, Mexico, September 11, 1939, and allotype female collected at Chilpancingo, Guerrero, Mexico, elevation 4,488 feet, September 10, 1939, by Plummer and DeLong. Paratype males from Iguala, Guerrero, elevation 2,398 feet, same date; Chilpancingo, Guerrero, October 25, 1941; Zamora, Michoacán, elevation 5,140 feet, October 2, 1941, all collected by Plummer, Good, Caldwell, and DeLong. A paratype from El Mante, Tamaulipas, elevation 264 feet, October 26, 1930, collected by Dr. Dampf (M. F. 1775).

I take pleasure in naming this species in honor of Dr. C. F. W. Muesebeck through whose kindness it has been possible to study the types of this genus in the U. S. National Museum and thus describe the Mexican species that have previously been unnamed.

Ollarianus tripartitus, n. sp.

Resembling *rudiculus* in form and general appearance but with distinct male genitalia. Length 4.5 mm.

Vertex broadly rounded, more than twice as wide between eyes at base as median length.

Color yellowish, vertex with a straight transverse row of four round black spots just before anterior margins of the eyes. The outer pair is much larger than the median pair. Pronotum with a round black spot behind each eye on anterior margin. A pair of round black proximal spots on disk of scutellum. Elytra subhyaline, veins pale brown. Face yellow.

Genitalia: Male plates long, gradually tapered to bluntly pointed apices. Style elongate, rather narrow, apical portion narrowed to a finger-like process which is curved slightly outwardly. Aedeagus short, erect, the basal and median processes are single, the apical-ventral portion is paired. Two pairs of spines are located on the pygofer. The apical pair arises on the apical dorsal portion and extends ventrally and anteriorly. The ventral pair arises at about the middle of the ventral margin and extends medially and apically.

Holotype male and paratype males collected at Iguala, Guerrero, Mexico, elevation 2,398 feet, September 11, 1939, and October 25, 1941. Paratype males from Mexcala, Guerrero, elevation 1,706 feet, December 13, 1929, collected by Dampf (M. F. 1513), and Veinco, Guerrero, September 3, 1940 (M. F. 1790).

Ollarianus insignis, n. sp.

Resembling *armus* in the intense color pattern but with distinct male genitalia. Length 5 mm.

Vertex broad, bluntly produced, less than twice as wide between eyes at base as median length.

Color gray, vertex with a transverse straight row of four black spots between anterior mar-

gins of eyes. The outer pair of spots is larger than the inner pair. Pronotum with brown mottling on disk, the humeral angle almost entirely covered by a large black spot. Scutellum pale with two black spots along outer margin on each side. Elytra marked with brown spots. Usually three pairs along commissure, a spot each side on disk and tips of elytra smoky. Face pale with two small proximal spots on upper portion.

Genitalia: Female last ventral segment with posterior margin sloping to median third, which is roundedly produced. Male plates long, strongly concavely narrowed to slender apices. Style gradually narrowed from base to form narrow apices, which are bent outwardly. Aedeagus rather short with a dorsal process at base. The main portion of aedeagus curved, extended apically with a pair of rather long apical spines extending ventrally and laterally. A pair of pygofer spines arises ventrally at about the middle and curves apically.

Holotype male collected at Puente de Ixtla, Morelos, December 27, 1929 by Dampf (M. F. 1557). Allotype, female, collected at Zamora, Michoacán, elevation 5,140 feet, October 2, 1941. Paratype males and females collected at Acapulco, Guerrero, elevation 328 feet, October 24, 1941; Chilpancingo, Guerrero, elevation 4,488 feet, October 25, 1941; Jiutepec, Morelos, elevation 3,500 feet, September 6, 1939; Iguala, Guerrero, elevation 2,398 feet, October 22, 1941; Zamora, Michoacán, elevation 5,140 feet, October 2, 1941; Tehuantepec, Oaxaca, elevation 328 feet, October 13, 1941; Mexcala, Guerrero, elevation 1,706 feet, October 22, 1941; Guadalajara, Jalisco, elevation 5,051 feet, October 3, 1941; Puente de Ixtla, Morelos, December 27, 1929; Pungarabato, Guerrero, August 22, 1930 (M. F. 1769); Zincauro, Guerrero, September 2, 1930 (M. F. 1789); and Paxtial, Guatemala, elevation 660 feet, September 14, 1925 (M. F. 807).

Ollarianus bidentatus, n. sp.

Resembling *ollus* in general form and appearance but with distinct genitalia. Length 4–4.5 mm.

Vertex broad and blunt, almost parallel-margined, about twice as wide between eyes at base as median length.

Color yellow with the usual row of four black spots between the anterior margins of the eyes. The outer pair is large and rounded, the inner pair minute. Scutellum with a small spot on either side not far from apex.

Genitalia: Female last ventral segment with posterior margin truncate, median third roundedly produced. Male plates long, strongly concavely rounded on outer margins to form long slender apices. Style broad at base, narrowed rather abruptly before middle, the apex pointed and bent outwardly. Aedeagus with a short dorsally directed process at base. The main portion of aedeagus elongate, narrowed toward apex with a pair of rather long slender pointed apical spines directed ventrally. One pair of pygofer spines arises on the dorsal portion near the middle. These are long and slender, extending ventrally and medially, then curving apically and extending almost to apices of the plates.

Holotype male, allotype female, and male paratypes collected at Iguala, Guerrero, elevation 2,398 feet, October 25, 1941, and September 11, 1939, by Plummer, Good, and DeLong. Paratype males collected at Balsas, Guerrero, August 15, 1930 (M. F. 1754); Zirandaro, Guerrero, elevation 639 feet, August 29, 1930 (M. F. 1786); San Geronimo, Guerrero, August 30, 1930 (M. F. 1787); Coyuca-Catalon, Guerrero, August 24, 1930 (M. F. 1771) by J. Parra; male paratypes were also collected at Jiutepec, Morelos, elevation 2,500 feet, September 6, 1939, and Valles, San Luis Potosí, elevation 312 feet, September 24, 1941, by Plummer, Good, Caldwell, and DeLong.

Ollarianus lobatus, n. sp.

Resembling *bidentatus* in form and appearance but with vertex more produced and with distinct genitalia. Length of male 5 mm.

Vertex broadly rounded and bluntly produced, basal width about twice median length. A little longer at middle than next the eyes.

Color yellow with a transverse row of four black spots on vertex between anterior margins of the eyes. The outer pair is rounded and larger. The inner pair is minute. Elytra subhyaline without conspicuous veins, face with traces of pale arcs.

Genitalia: Male plates rather long, concavely rounded on apical half to form pointed apices. Style broad at base rapidly narrowed to narrow, pointed outwardly bent apices. Aedeagus with a dorsally extended lobate structure at

base. The main portion is curved, directed apically and bears a pair of rather long laterally directed spines at apex. Pygofers with a pair of ventral spines arising not far from base which extend inwardly and curve apically.

Holotype male collected at San Geronimo, Guerrero, August 30, 1930, by J. Parra (M. F. 1787).

Ollarianus vestigii, n. sp.

Resembling *strictus* in general form and appearance but with distinct male genitalia. Length 4–4.5 mm.

Vertex broad, bluntly produced, more than twice as broad at base as median length.

Color, vertex yellow with faint traces of the four black spots on anterior portion between eyes. The median pair is most easily recognized. Pronotum dull gray. Scutellum with a transverse row of minute round spots across disc. Elytra subhyaline with dark brown veins especially the apical cross veins, which are conspicuous. Three pairs of brown spots along commissure on clavus and small brown spots on base, corium, and posterior clavus. Apical portion smoky.

Genitalia: Female last ventral segment with posterior margin truncate, median third rather broadly, roundedly produced with a brown mark at middle and one either side of produced portion. Male plates elongate, triangular, tapered to acute, pointed apices. Style long, narrowed near base, apical portion excavated on outer margin and curved outwardly. Aedeagus composed of a long slender ventral portion which is curved dorsally and bears a hook at apex. A shorter but slightly thicker portion arises at base and curves dorsally. The pair of apical pygofer spines is elongate, slender, and broadened to form a footlike apex. The ventral pair arises basally, is rather long, and extends inwardly.

Holotype male, allotype female, and female paratype collected at Palomas, San Luis Potosí, October 12, 1931, by Dr. Alfonse Dampf (M. B. 338).

This species can be separated from *ollus* to which it is apparently closely related by the longer apical spines, which are broadened at the apex to form a footlike structure, and the absence of the ventral pygofer spines.

ENTOMOLOGY.—*Studies on flower flies (Syrphidae) in the Vienna Museum of Natural History.*[1] F. M. Hull. University of Mississippi. (Communicated by Alan Stone.)

This paper presents the final study of some syrphid flies from a small collection submitted to the author in 1936 through the courtesy of Dr. Hans Czerny, whom I wish to thank for the opportunity of studying them. Other short articles have described species from this material from time to time. The types of the flies here described were deposited in the Naturhistorischer Museum in Vienna in 1938.

Genus **Baccha** Fabricius

Baccha ariela, n. sp.

This species is readily recognized by the large, central, irregular triangle of brown upon the middle of the wing, which connects broadly with the complete, anterior border of brown. Related to *clarapex* Wiedemann.

Female.—Length 11 mm; wing 10 mm. *Head:* hemispherical. The vertex and front are dark, shining brown, obscured by mold, probably violaceous in life. The large, shield-shaped, light-brown area before the antennae contains a small shining black spot. The antennae are widely separated and short. The third segment is thick and rounded. The face is rather prominent; the very large tubercle juts barely farther than the antennal prominence. The antennae are dark brown. The arista is short and thickened and black. The face is light reddish brown or yellow. The tubercle is dark brown and diffuse. From the lower part of the tubercle, along the oral margins of each side, there is a narrow blackish stripe running to the black cheeks. The cheeks posteriorly and along the oral margin are dark brown. The extreme lower occiput along the oral margin is light brown. The eyes are strongly excised just above the middle, silver-pubescent and scalose-pilose. The occiput behind is quite concave, so that the head fits well over the thorax and is very much wider than the thorax. *Thorax:* the dorsum is dully shining black with a strong

[1] Received July 31, 1944